

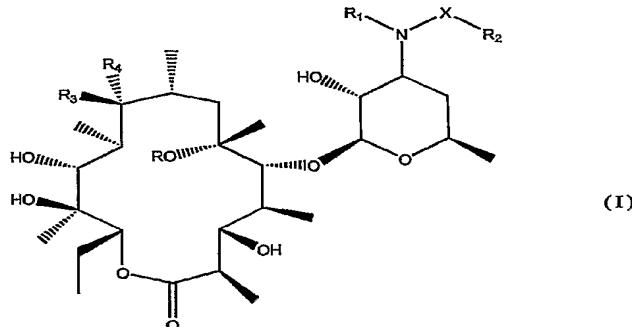
- 41 -

Claims

1) A compound of formula

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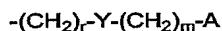
wherein

X is a -C(=O)-, -C(=O)-O-, -C(=O)-N-, -SO₂- or -SO₂-N group;

R is a hydrogen atom or methyl;

15 R₁ is a hydrogen atom or a (C₁-C₃)-alkyl group;

R₂ is a hydrogen atom, a (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl group, a (C₅-C₇)-cycloalkyl group, a phenyl or a five- or six-membered heteroaryl having from one to three heteroatoms selected among nitrogen, oxygen and sulphur, a phenyl-(C₁-C₄)-alkyl or heteroaryl-(C₁-C₄)-alkyl group optionally substituted by 1 to 3 substituents selected among a (C₁-C₄)-alkyl group, a (C₁-C₄)-alkoxy group and halogen, or a chain of formula



wherein

A is a phenyl or a five- or six-membered heteroaryl having from one to three heteroatoms selected among nitrogen, oxygen and sulphur, both ones optionally substituted by 1 to 3 substituents selected among a (C₁-C₄)-alkyl group, a (C₁-C₄)-alkoxy group or halogen;

25 Y represents O, S or NR₆ wherein R₆ is a hydrogen atom, a linear or branched (C₁-C₃) alkyl, a (C₁-C₃)-alkoxycarbonyl group or a benzyloxycarbonyl group;

30 r is an integer comprised between 1 and 3;

- 42 -

m is an integer comprised between 0 and 3;

R₃ is a hydroxy group or R₃ taken together with R₄ forms a (=O) group or a =N-O-R₅ group wherein R₅ is a hydrogen atom, a (C₁-C₄)-alkyl group, a benzyl or a-X-R₂

5 group wherein X and R₂ have the corresponding meanings defined above;

R₄ is a hydrogen atom or R₄ taken together with R₃ forms a (=O) group or a =N-O-R₅ group wherein R₅ has the meanings defined above;

and furthermore R₂ is a (C₁-C₁₀)-alkyl group or a (C₄-C₁₀)-alkyl group when, at the same time, X is a -C(=O)- group, R₁ is a (C₁-C₃)-alkyl group and R₃ is a hydroxy

10 group or R₃ taken together with R₄ forms a =N-O-R₅ group wherein R₅ is different from -X-R₂;

and pharmaceutically acceptable salts thereof.

2) A compound according to claim 1 wherein R, R₁, R₂ have the meanings as defined in formula I, X is a -C(=O)-, -C(=O)-N- or -SO₂- group and R₃ is a hydroxy group or

15 R₃ taken together with R₄ forms a (=O) group or a =N-O-R₅ group wherein R₅ is a hydrogen atom, methyl, benzyl or a -X-R₂ group wherein X and R₂ have the meanings as defined in formula I.

3) A compound according to claim 2 wherein R₁ is a hydrogen atom or methyl and R₅ is a hydrogen atom or a -X-R₂ group wherein X and R₂ have the meanings as

20 defined in formula I.

4) A compound according to claim 3 wherein R₂ is a hydrogen atom, a (C₁-C₄)-alkoxy-(C₁-C₄)-alkyl group, a (C₅-C₇)-cycloalkyl group, a phenyl or a five- or six-membered heteroaryl having from one to three heteroatoms selected among nitrogen, oxygen and sulphur, a phenyl-(C₁-C₄)-alkyl or heteroaryl-(C₁-C₄)-alkyl group

25 optionally substituted by 1 to 3 substituents selected among a (C₁-C₄)-alkyl group, a (C₁-C₄)-alkoxy group and halogen, or a chain of formula

wherein -(CH₂)_r-Y-(CH₂)_m-A

A is a phenyl or a heteroaryl selected among furan, thiophene, oxazole, imidazole,

30 pyridine, pyrimidine and triazole both ones optionally substituted by 1 to 3

- 43 -

substituents selected among a (C₁-C₄)-alkyl group, a (C₁-C₄)-alkoxy group or halogen;

Y represents O, S or NR₆ wherein R₆ is a hydrogen atom or methyl;

5 r is an integer comprised between 1 and 3;

m is an integer comprised between 0 and 3;

and furthermore R₂ is a (C₁-C₁₀)-alkyl group or a (C₄-C₁₀)-alkyl group when, at the same time, X is a-C(=O)- group, R₁ is a (C₁-C₃)-alkyl group and R₃ is a hydroxy group or R₃ taken together with R₄ forms a =N-O-R₅ group wherein R₅ is different

10 from -X-R₂.

5) A compound according to claim 1 wherein R₁ is methyl and R₂ is a metoxy-(C₁-C₃)-alkyl group, a (C₅-C₇)-cycloalkyl group, a phenyl or a heteroaryl selected among furan, thiophene, oxazole and pyridine, a benzyl or heteroaryl-(C₁-C₄)-alkyl group optionally substituted by a substituent selected among a (C₁-C₄)-alkyl group, a 15 metoxy group and halogen, or a chain of formula

wherein -(CH₂)_rY-(CH₂)_m-A

A is a phenyl or a heteroaryl selected among furan, thiophene, oxazole and pyridine, both ones optionally substituted by a substituent selected among a (C₁-C₄)-alkyl

20 group, a metoxy group or halogen;

Y represents O, S or NR₆ wherein R₆ is a hydrogen atom;

r is an integer comprised between 1 and 3;

m is an integer selected among 0 and 1;

and furthermore R₂ is a (C₁-C₇)-alkyl group or a (C₄-C₁₀)-alkyl group when, at the

25 same time, X is a-C(=O)- group, R₁ is a (C₁-C₃)-alkyl group and R₃ is a hydroxy group or R₃ taken together with R₄ forms a =N-O-R₅ group wherein R₅ is different from -X-R₂.

6) A compound according to claim 1 wherein R, R₁, R₂ and X have the meanings as defined in formula I, R₃ is a hydroxy group and R₄ is a hydrogen atom.

30 7) A compound according to claim 6 wherein R₁ is a hydrogen atom or methyl and X

- 44 -

is a -C(=O)- , -C(=O)-N- or $\text{-SO}_2\text{-}$ group.

8) A compound according to claim 7 wherein R_2 is a hydrogen atom, a $(C_1\text{-}C_4)$ -alkoxy- $(C_1\text{-}C_3)$ -alkyl group, a $(C_5\text{-}C_7)$ -cycloalkyl group, a phenyl or a five- or six-membered heteroaryl having from one to three heteroatoms selected among nitrogen, oxygen and sulphur, a phenyl- $(C_1\text{-}C_4)$ -alkyl or heteroaryl- $(C_1\text{-}C_4)$ -alkyl group optionally substituted by a substituent selected among a $(C_1\text{-}C_4)$ -alkyl group, a $(C_1\text{-}C_4)$ -alkoxy group and halogen, or a chain of formula

10 $\text{-(CH}_2\text{)}_r\text{Y-(CH}_2\text{)}_m\text{A}$
wherein

A is a phenyl or a heteroaryl selected among furan, thiophene, oxazole, imidazole, pyridine, pyrimidine and triazole both ones optionally substituted by a substituent selected among a $(C_1\text{-}C_4)$ -alkyl group, a $(C_1\text{-}C_4)$ -alkoxy group or halogen;

Y represents O, S or NR_6 wherein R_6 is a hydrogen atom or methyl;

15 r is an integer comprised between 1 and 3;

m is an integer selected among 0 and 3;

and furthermore R_2 is a $(C_1\text{-}C_7)$ -alkyl group or a $(C_4\text{-}C_{10})$ -alkyl group when, at the same time, X is a C(=O)- group, R_1 is a $(C_1\text{-}C_3)$ -alkyl group and R_3 is a hydroxy group or R_3 taken together with R_4 forms a $=\text{N-O-R}_5$ group wherein R_5 is different

20 from -X-R_2 .

9) A compound according to claim 8 wherein R_1 is methyl and R_2 is a hydrogen atom, a methoxy- $(C_1\text{-}C_3)$ -alkyl group, a $(C_5\text{-}C_7)$ -cycloalkyl group, a phenyl or a heteroaryl selected among furan, thiophene, oxazole and pyridine, a benzyl or heteroaryl-methyl group wherein heteroaryl is selected among furan, thiophene, 25 oxazole and pyridine, optionally substituted by a substituent selected among a $(C_1\text{-}C_4)$ -alkyl group, a metoxy group and halogen, or a chain of formula

wherein $\text{-(CH}_2\text{)}_r\text{Y-(CH}_2\text{)}_m\text{A}$

A is a phenyl or a heteroaryl selected among furan, thiophene, oxazole and pyridine,

30 both ones optionally substituted by a substituent selected among a methyl group, a

- 45 -

methoxy group or halogen;

Y represents O, S or NR₆ wherein R₆ is a hydrogen atom;

r is an integer comprised between 1 and 3;

5 m is an integer selected among 0 and 1;

and furthermore R₂ is a (C₁-C₇)-alkyl group or a (C₄-C₁₀)-alkyl group when, at the same time, X is a-C(=O)- group, R₁ is a (C₁-C₃)-alkyl group and R₃ is a hydroxy group or R₃ taken together with R₄ forms a =N-O-R₅ group wherein R₅ is different from -X-R₂.

10 10) A compound according to claim 9 wherein R₂ is a methoxy-methyl group, a cycloesyl, a phenyl or a heteroaryl selected among furan, thiophene, oxazole and pyridine, a benzyl or thiophen-1-yl-methyl group optionally substituted by a substituent selected among a methyl group, a methoxy group and halogen, or a chain of formula

15 wherein -(CH₂)_r-Y-(CH₂)_m-A

A is a phenyl or pyridine, both ones optionally substituted by a methoxy group;

Y represents O, S or NR₆ wherein R₆ is a hydrogen atom;

r is an integer comprised between 1 and 3;

m is an integer selected between 0 and 1;

20 and furthermore R₂ is a (C₁-C₇)-alkyl group or a (C₄-C₁₀)-alkyl group when, at the same time, X is a-C(=O)- group, R₁ is a (C₁-C₃)-alkyl group and R₃ is a hydroxy group or R₃ taken together with R₄ forms a =N-O-R₅ group wherein R₅ is different from -X-R₂.

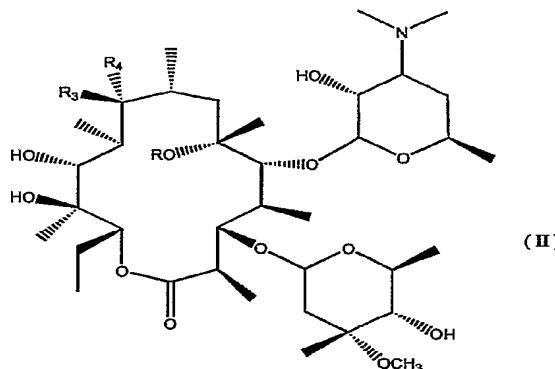
11) A compound according to claim 1 wherein the -X-R₂ substituent in the meanings
25 of R₅ has the same meanings of the X and R₂ substituents at 3' position.

12) A process for the preparation of a compound according to claim 1 which comprises:

a. the demethylation of the dimethylamino group at 3' position of a compound of formula

- 46 -

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10 wherein

R, R₃ and R₄ are as defined as in claim 1;

b. the removal of L-cladinose by a hydrolysis reaction;

c. the amidation reaction of the primary or secondary aminic group obtained by item a.

15 13) A process according to claim 12 wherein R₃ in formula II is a hydroxy group and R₄ is a hydrogen atom.

14) A process according to claim 12 wherein the removal of the cladinose is carried out by an acid catalyzed hydrolysis in presence of a mineral acid and of a protic organic solvent.

20 15) A pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 in admixture with a pharmaceutically acceptable carrier.

16) A pharmaceutical composition according to claim 15 useful in the treatment of inflammatory diseases.

25 17) A pharmaceutical composition according to claim 15 useful in the treatment of respiratory diseases.

18) A pharmaceutical composition according to claim 16 useful in the treatment of gastrointestinal diseases.